LISTING OF THE CLAIMS

This listing is provided for convenience. No amendment is intended.

1. (Previously presented) A communications receiver that comprises:

an analog-to-digital converter that samples a DMT (discrete multi-tone) signal to obtain a digital receive signal;

a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal; and

a detection module configured to determine a channel symbol from the frequency component amplitudes while accounting for correlation between the frequency component amplitudes of the digital receive signal.

2. (Original) The receiver of claim 1, wherein the detection module determines the most probable channel symbol given the amplitudes determined by the transform module.

3. (Original) The receiver of claim 1, wherein the detection module includes:

a weighted sum unit associated with each frequency component, wherein each weighted sum unit combines a plurality of amplitudes from the transform module in a manner designed to minimize any error between the output of the weighted sum unit and a valid output value.

4. (Original) The receiver of claim 1, wherein the detection module determines the channel symbol that corresponds to a matrix product of a matrix M and a vector of amplitudes from the

transform module, wherein the matrix M minimizes a square of an expected error between the channel symbol and valid channel symbols.

5. (Original) The receiver of claim 1, wherein the detection module includes:

a subtraction module that removes trailing intersymbol interference from the output of the transform module to obtain ISI-corrected frequency component values;

a decision unit that determines a matrix product of a matrix M and a vector of ISI-corrected frequency component values to obtain the channel symbol; and

a feedback module that determines a matrix product of a matrix T and the channel symbol from the decision unit to provide the trailing intersymbol interference to the subtraction module.

6. (Original) The receiver of claim 1, further comprising:

a time domain equalizer that operates on the digital receive signal to maximize a percentage of impulse response energy in a predetermined interval.

7. (Original) The receiver of claim 1, further comprising:

a cyclic prefix remover that removes prefixes from the digital receive signal, each prefix being associated with a respective channel symbol.

8. (Original) The receiver of claim 1, further comprising:

an error correction code decoder that decodes channel symbols received from the detection module.

9. (Original) The receiver of claim 1, wherein the transform module performs a fast Fourier Transform (FFT) on the receive signal in each channel symbol interval.

10. (Previously presented) A communications receiver that comprises:

an analog-to-digital converter that samples a DMT (discrete multi-tone) signal to obtain a digital receive signal;

a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal; and

a detection module configured to determine a channel symbol from the amplitudes while accounting for correlation between the amplitudes,

wherein the transform module includes a bank of matched bandpass filters.

11. (Previously presented) A method of receiving OFDM (orthogonal frequency division multiplexing) modulated data, wherein the method comprises:

determining a set of frequency component amplitudes associated with a channel symbol interval of a receive signal; and

determining a channel symbol associated with the set of frequency component amplitudes while accounting for correlation between the frequency component amplitudes associated with the channel symbol interval of the receive signal.

12. (Original) The method of claim 11, wherein said determining a channel symbol includes:

identifying a channel symbol that is most probably correct given the set of frequency component amplitudes.

13. (Original) The method of claim 11, wherein said determining a channel symbol includes:

for each frequency component:

calculating a weighted sum of frequency component amplitudes that minimizes expected error energy of the frequency component.

14. (Previously presented) A method of receiving OFDM (orthogonal frequency division multiplexing) modulated data, wherein the method comprises:

determining a set of frequency component amplitudes associated with a channel symbol interval of a receive signal; and

determining a channel symbol associated with the set of frequency component amplitudes while accounting for correlation between the frequency component amplitudes associated with the channel symbol interval of the receive signal, wherein said determining a channel symbol includes:

determining a product of a matrix M and the set of frequency component amplitudes, wherein the matrix M includes at least two non-zero values in each row.

15. (Original) The method of claim 11, wherein said determining a channel symbol includes:

subtracting intersymbol interference from the set of frequency component amplitudes to obtain an ISI-corrected set of frequency component amplitudes;

determining a product of a matrix M and the ISI-corrected set of frequency component amplitudes to obtain the channel symbol; and

determining a product of a matrix T and the channel symbol to obtain the intersymbol interference in a subsequent set of frequency component amplitudes.

16. (Original) The method of claim 11, further comprising:

processing the receive signal to shorten the effective channel impulse response before performing said determining a set of frequency component amplitudes.

17. (Original) The method of claim 11, further comprising:

removing a prefix from each symbol interval of the receive signal before performing said determining a set of frequency component amplitudes.

18. (Original) The method of claim 11, wherein said determining a set of frequency component amplitudes includes:

converting the receive signal into digital form; and

performing a fast Fourier Transform on the digital receive signal.

19. (Previously presented) A communications system that comprises:

a transmitter that transmits an OFDM modulated signal; and

a receiver that receives and demodulates a corrupted version of the OFDM modulated signal, wherein the receiver includes:

an analog-to-digital converter that samples the corrupted OFDM-modulated signal to obtain a digital receive signal;

a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal; and

a detection module configured to determine a channel symbol from the frequency component amplitudes while accounting for correlation between the frequency component amplitudes of the digital receive signal.

20. (Original) The system of claim 19, wherein the detection module determines the most probable channel symbol given the amplitudes determined by the transform module.

21. (Original) The system of claim 19, wherein the detection module includes:

a weighted sum unit associated with each frequency component, wherein each weighted sum unit combines a plurality of amplitudes from the transform module in a manner designed to minimize any error between the output of the weighted sum unit and a valid output value.

22. (Original) The system of claim 19, wherein the detection module determines the channel symbol that corresponds to a matrix product of a matrix M and a vector of amplitudes from the transform module, wherein the matrix M minimizes a square of an expected error between the channel symbol and valid channel symbols.

23. (Original) The system of claim 19, wherein the detection module includes:

a subtraction module that removes trailing intersymbol interference from the output of the transform module to obtain ISI-corrected frequency component values;

a decision unit that determines a matrix product of a matrix M and a vector of ISI-corrected frequency component values to obtain the channel symbol; and

a feedback module that determines a matrix product of a matrix T and the channel symbol from the decision unit to provide the trailing intersymbol interference to the subtraction module.